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PURSUANT TO
PROTECTIVE ORDER

EXHIBIT B

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INFRINGEMENT OF U.S. 8,374,511 BY FUJITSU

Fujitsu Network Communications ("Fujitsu") infringed one or more claims of U.S. 8,374,511 by selling and offering for sale the Fujitsu 100G OIF 168pin Coherent Transceiver (FIM85200), 100G CFP DCO Transceiver (FIM38000/100; FIM38100/100), 100G/200G CFP2 ACO Transceiver (FIM38500; FIM38100), 100G CFP Transceiver (FIM37101; FIM37102; FIM37201; FIM37102), 100G CFP2 Transceiver (FIM37301; FIM37302; FIM37401; FIM37402), 100G QSFP28 Transceiver (FIM37700; FIM37800), 100G/400G LN Modulator (FTM7992HM; FTM7990HKA; FTM7977HQA), 100G/400G Integrated Coherent Receiver (FIM24901; FIM24721), HD62 OTN Switch Aggregator Unit, TM61 OTU4 OTN Transponder Demarcation Unit, and Flashwave 7420 WDM Platform products, as well as the compatible chassis in which they are installed, and other products operating in a substantially similar manner such as, for example, the Flashwave 9500 Platform product and all compatible components and chassis, and the 1Finity Platform product and all compatible components and chassis. (the "Accused Instrumentalities").

Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
1	[pre] A method for operating an optical fiber multiplexor comprising:	Fujitsu infringed Claim 1, and the claims discussed herein that directly or indirectly depend on Claim 1, by making, selling, using, offering for sale, and/or causing to be used the Accused Instrumentalities. To the extent that the preamble is considered to be a limitation, the Accused Instrumentalities comprise devices that practice a method for operating an optical fiber multiplexor. For example: the Fujitsu 1100G OIF 168pin Coherent Transceiver (FIM85200) is a transceiver card with a transmitting and receiving interface for DP-QPSK data. (100G OIF 168pin Coherent Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gtrx/index.html); the Fujitsu 100G CFP DCO Transceiver (FIM38000/100; FIM38100/100) is a transceiver card with a transmitting and receiving interface for DP-QPSK data. (100G CFP DCO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp-dco/);

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		the Fujitsu 100G/200G CFP2 ACO Transceiver (FIM38500; FIM38100) is a transceiver card with a transmitting and receiving interface for DP-QPSK data. (100G/200G CFP2 ACO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp2-aco/); the Fujitsu 100G CFP Transceiver (FIM37101; FIM37102; FIM37201; FIM37102) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G CFP Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp/); the Fujitsu 100G CFP2 Transceiver (FIM37301; FIM37302; FIM37401; FIM37402) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G CFP2 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp2/); the Fujitsu 100G QSFP28 Transceiver (FIM37700; FIM37800) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100g-qsfp28/); the Fujitsu 100G/400G LN Modulator (FTM7992HM; FTM7990HKA; FTM7977HQA) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G Optical Devices Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); the Fujitsu 100G/400G Integrated Coherent Receiver (FIM24901; FIM24721) is a component of a transceiver with receiving interface for DP-QPSK data (100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); the Fujitsu HD62 OTN Switch Aggregator Unit is a transceiver card with a transmitting and receiving interface for DP-QPSK data (Flashwave CDS Data Sheet); the Fujitsu TM61 OTU4 OTN Transponder Demarcation Unit is a transceiver card with a transmitting and receiving interface for DP-QPSK data (Flashwave CDS Data Sheet); and the Fujitsu Flashwave 7420 WDM Platform a transceiver card with a transmitting and receiving interface for DP-QPSK data (Flashwave 7420 Data Sheet)

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		By way of example and without any limitation, the OIF 100G standard taught a transceiver module, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 8-9 ("All the blocks illustrated are contained on a single printed circuit board. The large block on the right represents the 100G transceiver module – electro mechanicals. As discussed above this OIF project addresses physical aspects of this module and the electrical data and control interfaces to it.").

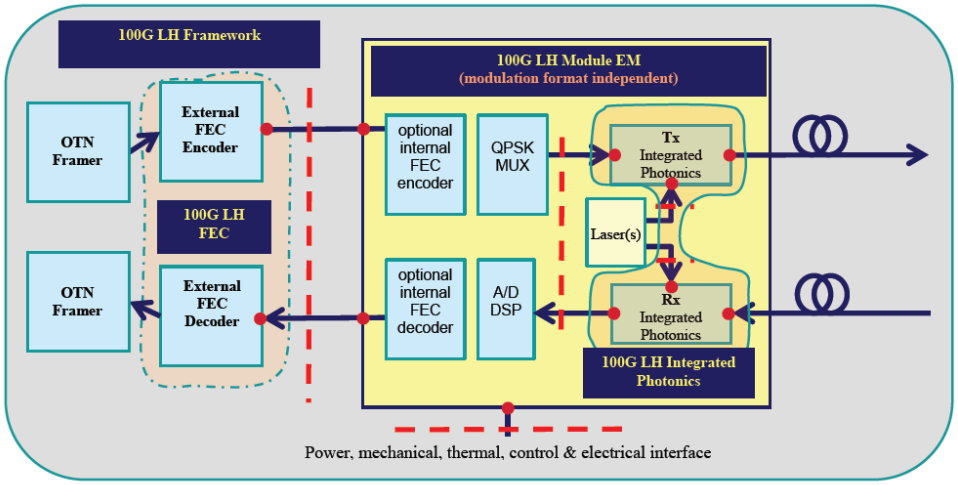

Figure 7. Block diagram of a transceiver module

By way of example and without any limitation, Fujitsu is a member of the OIF 100G standard. See, e.g., OIF-DPC-MRX-01.0-IA at 32.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement

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12 Appendix C: List of companies belonging to the OIF at approval date

Acacia Communications	Fujikura	NeoPhotonics
ADVA Optical Networking	Fujitsu	NTT Corporation
Alcatel-Lucent	Furukawa Electric Japan	Oclaro
Altera	Google	Orange
AMCC	Hewlett Packard	PacketPhotonics
Amphenol Corp.	Hitachi	PETRA
Analog Devices	Huawei Technologies	Picometrix
Anritsu	IBM Corporation	PMC Sierra
Applied Communication Sciences	Infinera	QLogic Corporation
Avago Technologies Inc.	Inphi	Qorvo
Broadcom	Intel	Ranovus
Brocade	Ixia	Rockley Photonics
BRPhotonics	JDSU	Samtec Inc.
BTI Systems	Juniper Networks	Semtech
China Telecom	Kaiam	Spirent Communications
Ciena Corporation	Kandou	Sumitomo Electric Industries
Cisco Systems	KDDI R&D Laboratories	Sumitomo Osaka Cement
ClariPhy Communications	Keysight Technologies, Inc.	TE Connectivity
Coriant R&G GmbH	LeCroy	Tektronix
CPqD	Luxtera	TELUS Communications, Inc.
Deutsche Telekom	M/A-COM Technology Solutions	TeraXion
Dove Networking Solutions	Mellanox Technologies	Texas Instruments
EMC Corp	Microsemi Inc.	Time Warner Cable
Emcore	Microsoft Corporation	US Conec
Ericsson	Mitsubishi Electric Corporation	Verizon
ETRI	Molex	Xilinx
FCI USA LLC	MoSys, Inc.	Yamaichi Electronics Ltd.
Fiberhome Technologies Group	MultiPhy Ltd	ZTE Corporation
Finisar Corporation	NEC	

Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]
	[a] feeding input data to a controller of a transmitter of a telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output;	The Accused Instrumentalities feed input data to a controller of a transmitter of a telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output. By way of example and without any limitation, the OIF 100G standard taught that the "signal [framed incoming data] then passes to the transceiver module. Data is converted to drive signals to control the optical modulators. A transmit laser provides the light source for the modulators. On the receive side the incoming signal is mixed with a local oscillator, demodulated into components, detected, amplified, digitized, then passed into the DSP module." OIF-FD-100G-DWDM-01.0 at 9 (see figure below).

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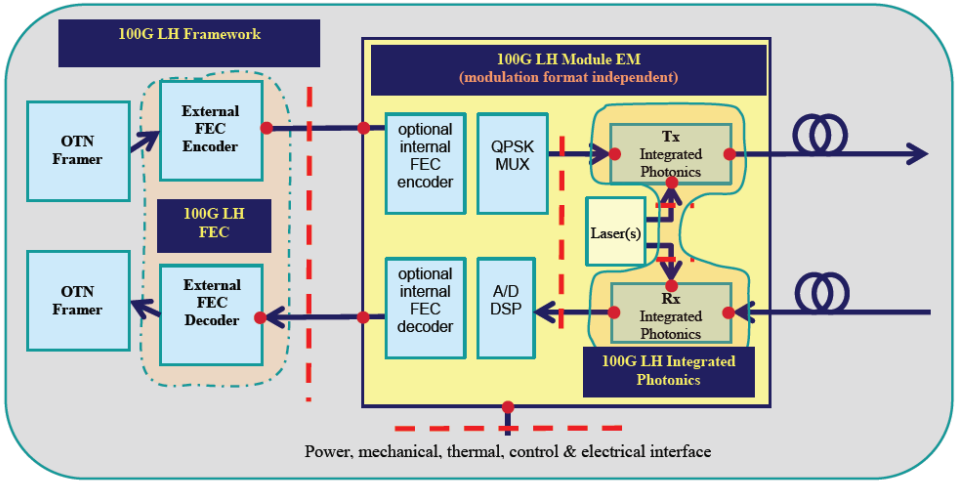
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 7. Block diagram of a transceiver module [redacted]

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]
	[b] using the controller, controlling a modulator to modulate light from a laser as a function of the input data;	The Accused Instrumentalities use the controller to control a modulator to modulate light from a laser as a function of the input data. By way of example and without any limitation, the OIF 100G standard taught that the "signal [framed incoming data] then passes to the transceiver module. Data is converted to drive signals to control the optical modulators. A transmit laser provides the light source for the modulators. On the receive side the incoming signal is mixed with a local oscillator, demodulated into components, detected, amplified, digitized, then passed into the DSP module." OIF-FD-100G-DWDM-01.0 at 9 (see figure below).

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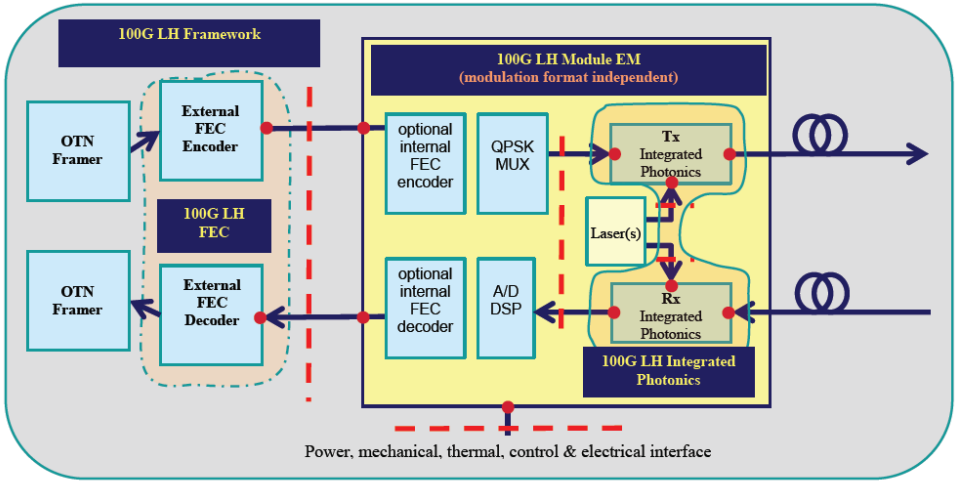
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 7. Block diagram of a transceiver module By way of example and without any limitation, the OIF 100G standard taught a transmitter module which includes a laser, modulators that modulate phase of the light, drivers, including other components that are not represented, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 5-6.

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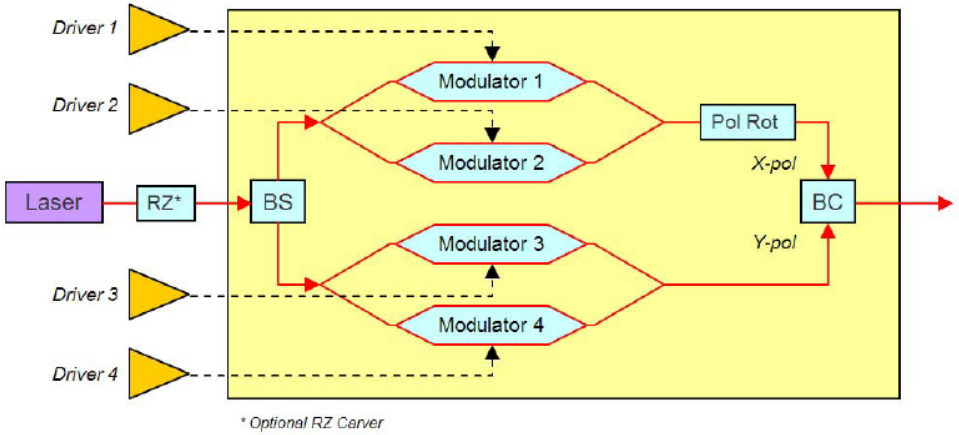
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 4. Block diagram of a DP QPSK transmitter module [redacted]

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]
	[c] sending the modulated light as an optical signal from the transmitter over an optical fiber;	The Accused Instrumentalities send modulated light as an optical signal from the transmitter over an optical fiber. The Accused Instrumentalities include a fiber output optically connected to an optical fiber to the card. By way of example and without any limitation, the Accused Instrumentalities include an optical fiber interface (100G OIF 168pin Coherent Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gtrx/index.html); 100G/200G CFP2 ACO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp2-aco/; 100G CFP Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp/; 100G CFP2 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp2/; 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100g-qsfp28/; 100G Optical Devices Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g; Flashwave CDS Data Sheet; Flashwave 7420 Data Sheet)

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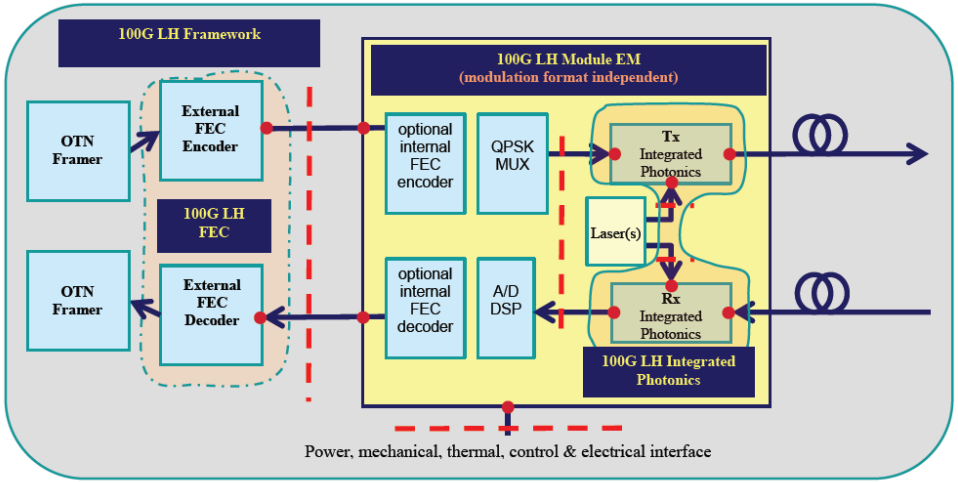
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		By way of example and without any limitation, the OIF 100G standard taught a transceiver module in which a modulated light optical signal is transmitted by Tx through a fiber output, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 9.  Figure 7. Block diagram of a transceiver module In further example and without limitation, the Flashwave 9500 Series and 1Finity products practice a method comprising the step of sending the modulated light as an optical signal from the transmitter over an optical fiber. *See* Exemplary Evidence of Infringement of Claim 1[b].
	[d] receiving the optical signals from the optical fiber at a receiver of a further	The Accused Instrumentalities receive optical signals from an optical fiber at a receiver of a further telecommunications box and converting the optical signals to electronic output data. The Accused Instrumentalities include a fiber input for connecting an optical fiber. By way of example and without any limitation, the Accused Instrumentalities include an optical fiber

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	telecommunications box and converting the optical signals to electronic output data;	interface (100G OIF 168pin Coherent Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gtrx/index.html); 100G/200G CFP2 ACO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp2-aco/; 100G CFP Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp/; 100G CFP2 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp2/; 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100g-qsfp28/; 100G Optical Devices Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g; Flashwave CDS Data Sheet; Flashwave 7420 Data Sheet) By way of example and without any limitation, the OIF 100G standard taught a transceiver module in which the optical signal is received by Rx through a fiber input and converted to electronic output data, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 9.

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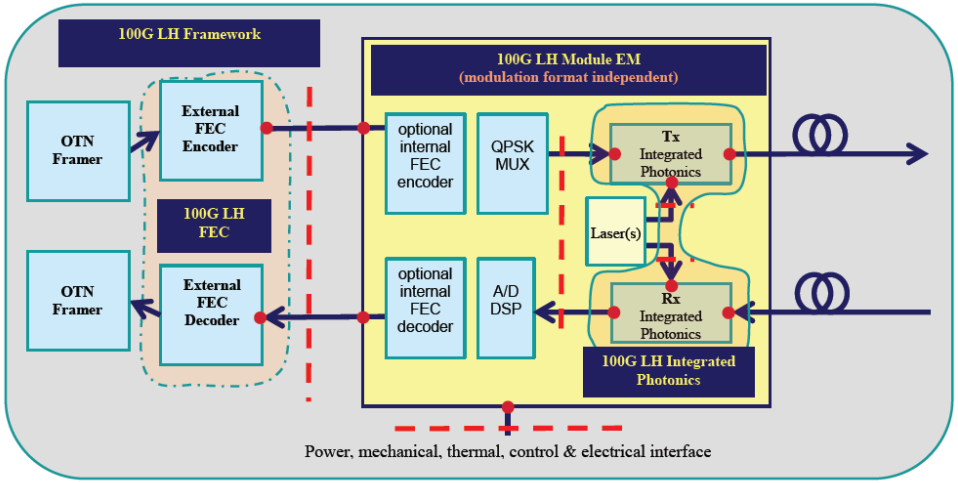
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 7. Block diagram of a transceiver module By way of example and without any limitation, the OIF 100G standard taught a receiver module which receives a phase modulated signal through an optical fiber, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 6.

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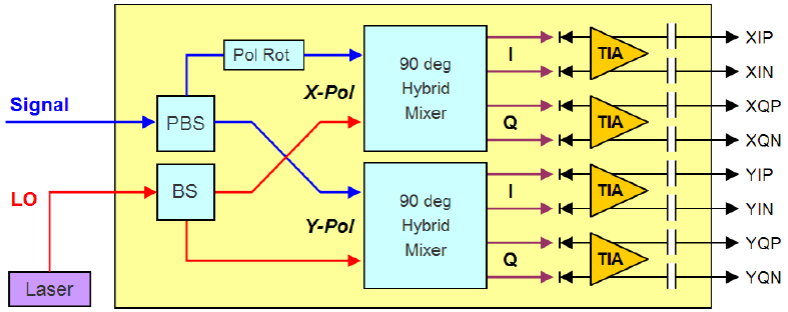
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 5. Block diagram of a DP QPSK receiver module, shown with balanced detection and outputs. [redacted]

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]
	[e] passing the optical signals to a photodetector to produce an electric signal;	The Accused Instrumentalities pass the optical signals to a photodetector to produce an electric signal. As noted above, the OIF 100G standard taught a transceiver module in which the optical signal is received by Rx through a fiber input and converted to electronic output data, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 9. By way of example and without any limitation, the OIF 100G standard taught a receiver module with a number of optical components that form a demodulator, followed by optical detectors and transimpedance amplifiers, as shown below. See, e.g., OIF-FD-100G-DWDM-01.0 at 6.

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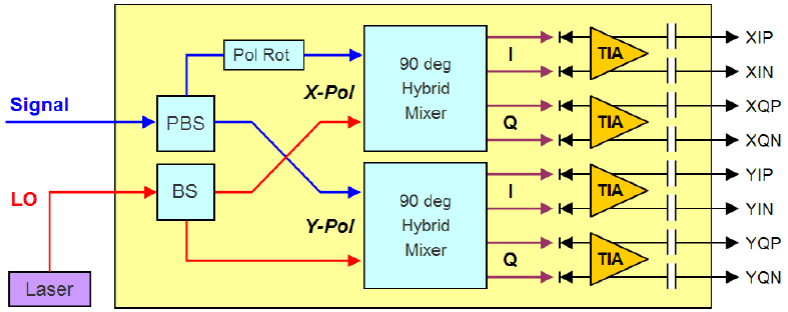
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 5. Block diagram of a DP QPSK receiver module, shown with balanced detection and outputs. By way of example and without any limitation, an OIF 100G standard taught that As indicated in Figure 2-1, the coherent receiver requires the following basic functionality: 1. Eight (8) photo-detectors, comprised of 4 sets of balanced detectors 2. Four (4) linear amplifiers with differential ADC coupled outputs 3. Two (2) ninety degree hybrid mixers with differential outputs 4. A polarization splitting element, separating the input signal into two orthogonal polarizations, with each polarization delivered to a hybrid mixer 5. A polarization maintaining power splitter or polarization splitting element, splitting the local oscillator power equally to the two hybrid mixers. 6. An optical power tap, and monitor photodiode in the signal input path before the signal polarization splitting element.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		7. A variable optical attenuator in the signal input path before the signal polarization splitting element. Additional required functionality for the integrated coherent receiver includes: • Automatic Gain Control (AGC) and/or Manual Gain Control (MGC) • User settable output voltage swing • Independent output swing adjustment for each of the four outputs • Peak indicators for each output (Figure 2-1 is presented below, showing the relationship of the functionalities in addition to the presence of ADC and DSP). OIF-DPC-MRX-01.0-IA at 10-11.

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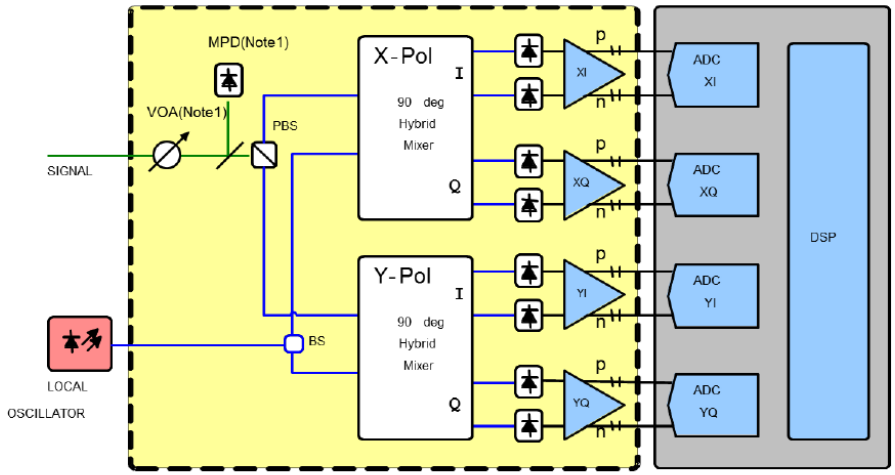
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 **Figure 2-1: Functional diagram of a dual polarization micro intradyne coherent receiver.** Notes: 1. One configuration for the order of the VOA and MPD is shown. The configuration with the MPD followed by the VOA is an equally acceptable configuration. 2. The yellow area enclosed by the dashed line indicates the functionality specified in this implementation agreement. [redacted]

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]

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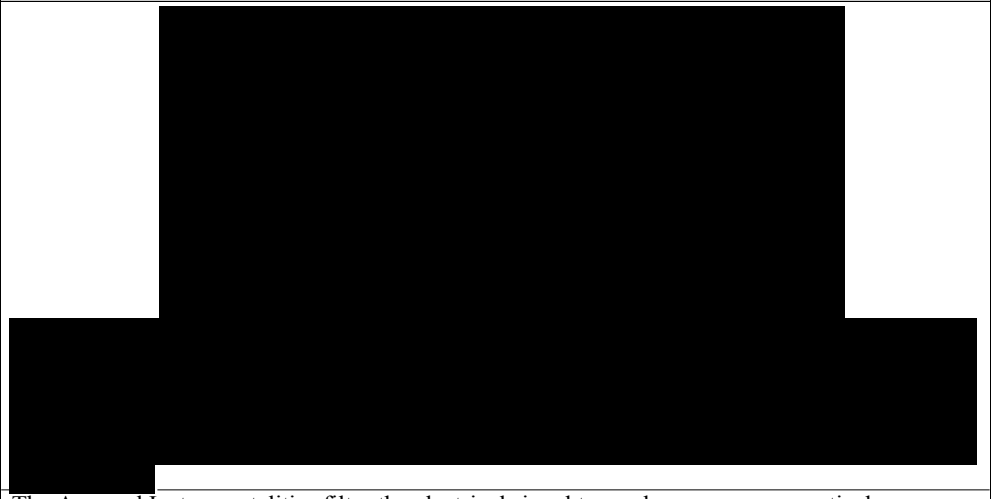
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		
	[f] and filtering the electrical signal to produce an average optical power.	The Accused Instrumentalities filter the electrical signal to produce an average optical power. By way of example and without any limitation, an OIF 100G standard disclosed the use of a splitter to split the incoming optical signal to divert a portion of optical signal to the monitor photodiode as the optical signal is received by the receiver for demodulation. The monitor photodiode is used to generate an electrical signal that is filtered to determine an average optical power. See, e.g., OIF-DPC-MRX-01.0-IA at 10-11; see also the figure below.

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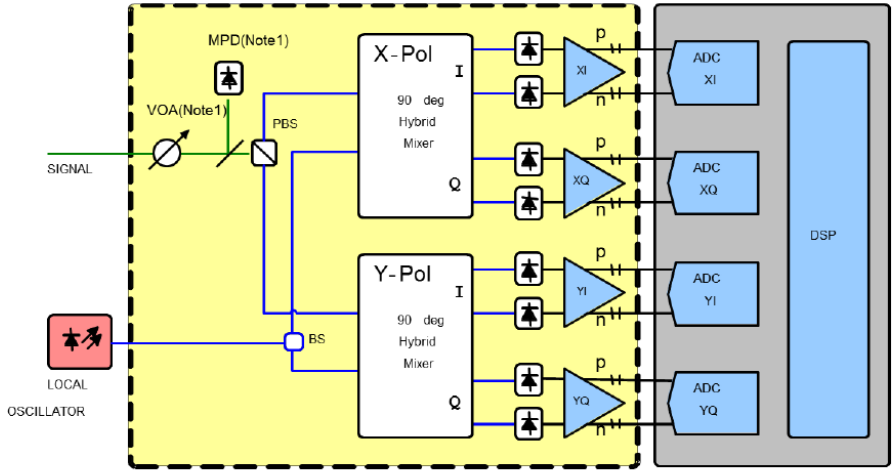
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 **Figure 2-1: Functional diagram of a dual polarization micro intradyne coherent receiver.** Notes: 1. One configuration for the order of the VOA and MPD is shown. The configuration with the MPD followed by the VOA is an equally acceptable configuration. 2. The yellow area enclosed by the dashed line indicates the functionality specified in this implementation agreement. [redacted]

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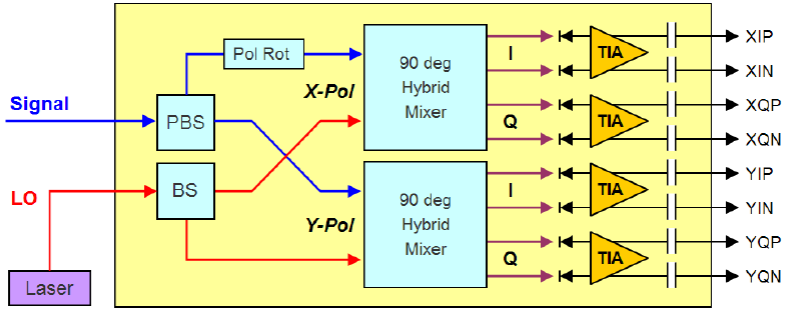
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]
2	The method as recited in claim 1 further comprising scaling the electrical signal after filtering with a logarithmic or linear amplifier.	On information and belief, the Accused Instrumentalities scale the electrical signal after filtering with a logarithmic or linear amplifier. By way of example and without any limitation, the OIF 100G standard stated that DP QPSK receiver module contains optical detectors and amplifiers, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 6.  Figure 5. Block diagram of a DP QPSK receiver module, shown with balanced detection and outputs. By way of example and without any limitation, an OIF 100G standard taught that As indicated in Figure 2-1, the coherent receiver requires the following basic functionality: 1. Eight (8) photo-detectors, comprised of 4 sets of balanced detectors

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		2. Four (4) linear amplifiers with differential ADC coupled outputs 3. Two (2) ninety degree hybrid mixers with differential outputs 4. A polarization splitting element, separating the input signal into two orthogonal polarizations, with each polarization delivered to a hybrid mixer 5. A polarization maintaining power splitter or polarization splitting element, splitting the local oscillator power equally to the two hybrid mixers. 6. An optical power tap, and monitor photodiode in the signal input path before the signal polarization splitting element. 7. A variable optical attenuator in the signal input path before the signal polarization splitting element. Additional required functionality for the integrated coherent receiver includes: • Automatic Gain Control (AGC) and/or Manual Gain Control (MGC) • User settable output voltage swing • Independent output swing adjustment for each of the four outputs • Peak indicators for each output (Figure 2-1 is presented below, showing the relationship of the functionalities in addition to the presence of ADC and DSP). OIF-DPC-MRX-01.0-IA at 10-11.

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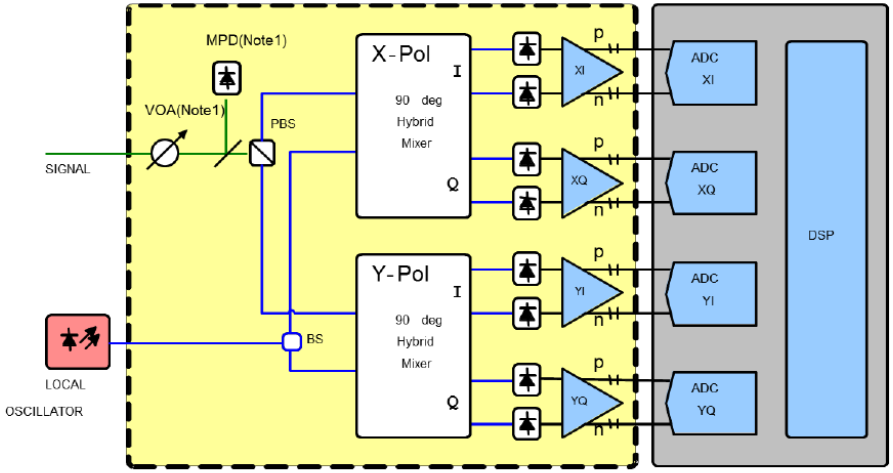
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 **Figure 2-1: Functional diagram of a dual polarization micro intradyne coherent receiver.** Notes: 1. One configuration for the order of the VOA and MPD is shown. The configuration with the MPD followed by the VOA is an equally acceptable configuration. 2. The yellow area enclosed by the dashed line indicates the functionality specified in this implementation agreement. On information and belief, the Flashwave 9500 Series and 1Finity Products practice the method as recited in claim 1 further comprising scaling the electrical signal after filtering with a logarithmic or linear amplifier.
3	The method as recited in claim 2 wherein the scaling is a function of an	On information and belief, the Accused Instrumentalities scale the electrical signal as a function of an expected optical power level.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	expected optical power level.	By way of example and without any limitation, an OIF 100G standard taught that devices should have "Alarm/Warning Threshold Registers," including an "RX Power Monitor Alarm/Warning Threshold Select." (OIF-CFP2-ACO-01.0, at 81) The the electrical signal is scaled as a function of an expected optical power level so that the alarm/warning threshold settings provide a meaningful indication of when the power is out of an acceptable range. 
4	The method as recited in claim 2 wherein the scaling is a function of a span	On information and belief, the Accused Instrumentalities scale the electrical signal as a function of a span length of the optical fiber.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	length of the optical fiber.	By way of example and without any limitation, an OIF 100G standard taught that devices should have "Alarm/Warning Threshold Registers," including an "RX Power Monitor Alarm/Warning Threshold Select." (OIF-CFP2-ACO-01.0, at 81) The the electrical signal is scaled as a function of an expected optical power level, such as that correlating to a span length of the optical fiber. so that the alarm/warning threshold settings provide a meaningful indication of when the power is out of an acceptable range. [redacted]
9	[pre] A method for operating an optical fiber multiplexor in a phase modulation mode comprising:	Fujitsu infringed Claim 1, and the claims discussed herein that directly or indirectly depend on Claim 1, by making, selling, using, offering for sale, and/or causing to be used the Accused Instrumentalities. To the extent that the preamble is considered to be a limitation, the Accused Instrumentalities comprise devices that practice a method for operating an optical fiber multiplexor. For example: the Fujitsu 1100G OIF 168pin Coherent Transceiver (FIM85200) is a transceiver card with a transmitting and receiving interface for DP-QPSK data. (100G OIF 168pin Coherent Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gtrx/index.html); the Fujitsu 100G CFP DCO Transceiver (FIM38000/100; FIM38100/100) is a transceiver card with a transmitting and receiving interface for DP-QPSK data. (100G CFP DCO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp-dco/); the Fujitsu 100G/200G CFP2 ACO Transceiver (FIM38500; FIM38100) is a transceiver card with a transmitting and receiving interface for DP-QPSK data. (100G/200G CFP2 ACO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp2-aco/);

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		the Fujitsu 100G CFP Transceiver (FIM37101; FIM37102; FIM37201; FIM37102) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G CFP Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp/); the Fujitsu 100G CFP2 Transceiver (FIM37301; FIM37302; FIM37401; FIM37402) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G CFP2 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp2/); the Fujitsu 100G QSFP28 Transceiver (FIM37700; FIM37800) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100g-qsfp28/); the Fujitsu 100G/400G LN Modulator (FTM7992HM; FTM7990HKA; FTM7977HQA) is a transceiver card with a transmitting and receiving interface for DP-QPSK data (100G Optical Devices Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); the Fujitsu 100G/400G Integrated Coherent Receiver (FIM24901; FIM24721) is a component of a transceiver with receiving interface for DP-QPSK data (100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); the Fujitsu HD62 OTN Switch Aggregator Unit is a transceiver card with a transmitting and receiving interface for DP-QPSK data (Flashwave CDS Data Sheet); the Fujitsu TM61 OTU4 OTN Transponder Demarcation Unit is a transceiver card with a transmitting and receiving interface for DP-QPSK data (Flashwave CDS Data Sheet); and the Fujitsu Flashwave 7420 WDM Platform a transceiver card with a transmitting and receiving interface for DP-QPSK data (Flashwave 7420 Data Sheet) By way of example and without any limitation, the OIF 100G standard taught a transceiver module, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 8-9 ("All the blocks illustrated are contained on a single printed circuit board. The large block on the right represents the 100G transceiver module – electro mechanicals. As discussed above this OIF project addresses physical aspects of this module and the electrical data and control interfaces to it.").

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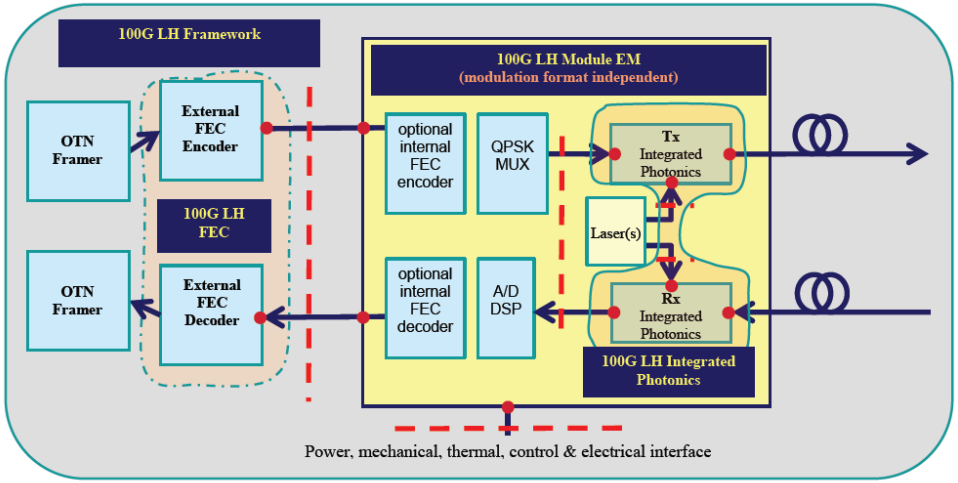
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 7. Block diagram of a transceiver module By way of example and without any limitation, Fujitsu is a member of the OIF 100G standard. See, e.g., OIF-DPC-MRX-01.0-IA at 32.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement

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12 Appendix C: List of companies belonging to the OIF at approval date

Acacia Communications	Fujikura	NeoPhotonics
ADVA Optical Networking	Fujitsu	NTT Corporation
Alcatel-Lucent	Furukawa Electric Japan	Oclaro
Altera	Google	Orange
AMCC	Hewlett Packard	PacketPhotonics
Amphenol Corp.	Hitachi	PETRA
Analog Devices	Huawei Technologies	Picometrix
Anritsu	IBM Corporation	PMC Sierra
Applied Communication Sciences	Infinera	QLogic Corporation
Avago Technologies Inc.	Inphi	Qorvo
Broadcom	Intel	Ranovus
Brocade	Ixia	Rockley Photonics
BRPhotonics	JDSU	Samtec Inc.
BTI Systems	Juniper Networks	Semtech
China Telecom	Kaiam	Spirent Communications
Ciena Corporation	Kandou	Sumitomo Electric Industries
Cisco Systems	KDDI R&D Laboratories	Sumitomo Osaka Cement
ClariPhy Communications	Keysight Technologies, Inc.	TE Connectivity
Coriant R&G GmbH	LeCroy	Tektronix
CPqD	Luxtera	TELUS Communications, Inc.
Deutsche Telekom	M/A-COM Technology Solutions	TeraXion
Dove Networking Solutions	Mellanox Technologies	Texas Instruments
EMC Corp	Microsemi Inc.	Time Warner Cable
Emcore	Microsoft Corporation	US Conec
Ericsson	Mitsubishi Electric Corporation	Verizon
ETRI	Molex	Xilinx
FCI USA LLC	MoSys, Inc.	Yamaichi Electronics Ltd.
Fiberhome Technologies Group	MultiPhy Ltd	ZTE Corporation
Finisar Corporation	NEC	

Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		[redacted]
	[a] feeding input data to a controller of a transmitter of a	The Accused Instrumentalities feed input data to a controller of a transmitter of a telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output;	By way of example and without any limitation, the OIF 100G standard taught that the "signal [framed incoming data] then passes to the transceiver module. Data is converted to drive signals to control the optical modulators. A transmit laser provides the light source for the modulators. On the receive side the incoming signal is mixed with a local oscillator, demodulated into components, detected, amplified, digitized, then passed into the DSP module." OIF-FD-100G-DWDM-01.0 at 9 (see figure below).

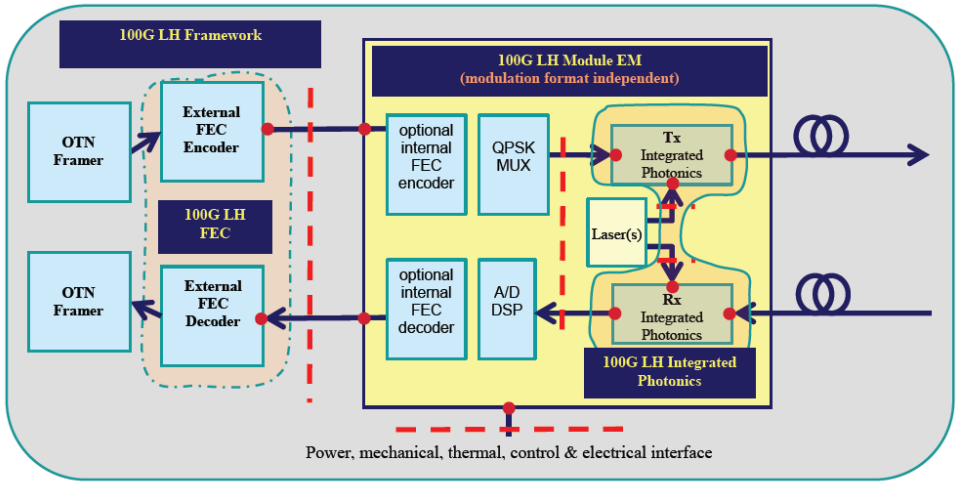

Figure 7. Block diagram of a transceiver module

By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise a method for feeding input data to a controller of a transmitter of a telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output. *See, e.g.*, Exemplary Evidence of Infringement of

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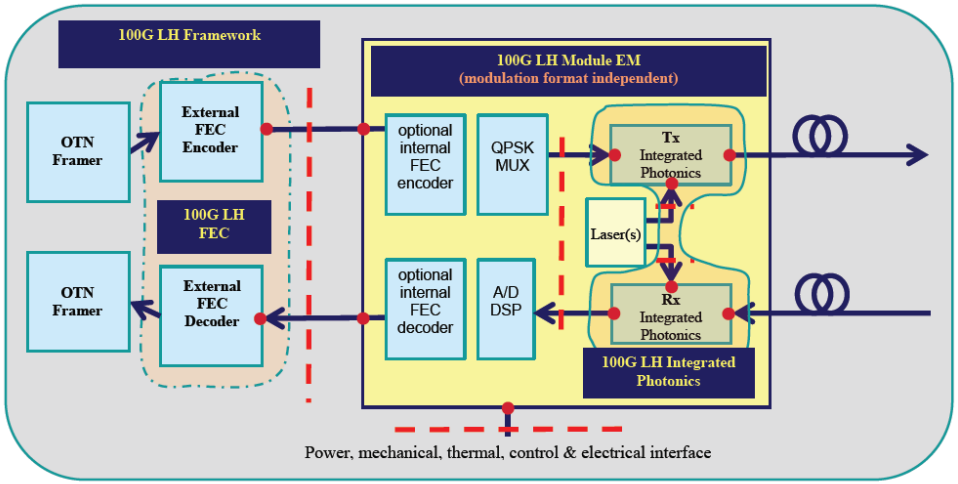
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		Claim 1[a].
	[b] using the controller, controlling a modulator to phase modulate light from a laser as a function of the input data;	The Accused Instrumentalities use the controller to control a modulator to modulate light from a laser as a function of the input data. By way of example and without any limitation, the OIF 100G standard taught that the "signal [framed incoming data] then passes to the transceiver module. Data is converted to drive signals to control the optical modulators. A transmit laser provides the light source for the modulators. On the receive side the incoming signal is mixed with a local oscillator, demodulated into components, detected, amplified, digitized, then passed into the DSP module." OIF-FD-100G-DWDM-01.0 at 9 (see figure below).  Figure 7. Block diagram of a transceiver module

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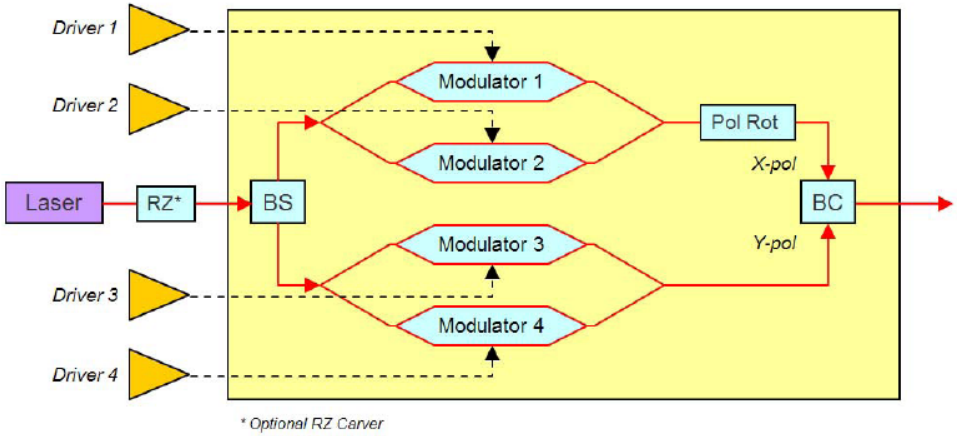
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		By way of example and without any limitation, the OIF 100G standard taught a transmitter module which includes a laser, modulators that modulate phase of the light, drivers, including other components that are not represented, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 5-6.  Figure 4. Block diagram of a DP QPSK transmitter module By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise a method for using the controller, controlling a modulator to phase modulate light from a laser as a function of the input data. *See, e.g.,* Exemplary Evidence of Infringement of Claim 1[b].
	[c] sending the modulated light as an optical signal from the transmitter over an optical fiber;	The Accused Instrumentalities send modulated light as an optical signal from the transmitter over an optical fiber. The Accused Instrumentalities include a fiber output optically connected to an optical fiber to the card. By way of example and without any limitation, the Accused Instrumentalities include an optical fiber interface (100G OIF 168pin Coherent Transceiver

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gtrx/index.html); 100G/200G CFP2 ACO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp2-aco/; 100G CFP Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp/; 100G CFP2 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp2/; 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100g-qsfp28/; 100G Optical Devices Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g; Flashwave CDS Data Sheet; Flashwave 7420 Data Sheet) By way of example and without any limitation, the OIF 100G standard taught a transceiver module in which a modulated light optical signal is transmitted by Tx through a fiber output, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 9.

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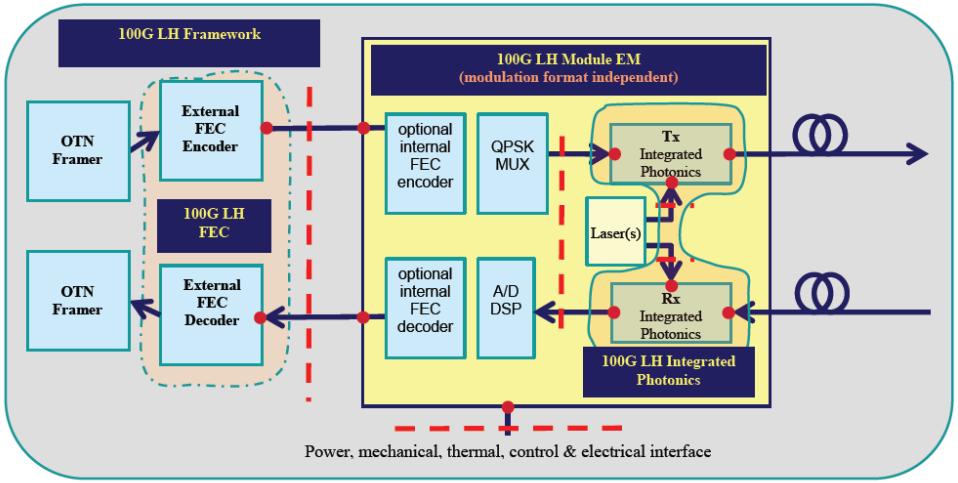
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 7. Block diagram of a transceiver module By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise a method for sending the modulated light as an optical signal from the transmitter over an optical fiber. *See, e.g.*, Exemplary Evidence of Infringement of Claim 1[c].
	[d] receiving the optical signals from the optical fiber at a receiver of a further telecommunications box and converting the optical signals to	The Accused Instrumentalities receive optical signals from an optical fiber at a receiver of a further telecommunications box and converting the optical signals to electronic output data. The Accused Instrumentalities include a fiber input for connecting an optical fiber. By way of example and without any limitation, the Accused Instrumentalities include an optical fiber interface (100G OIF 168pin Coherent Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gtrx/index.html);

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	electronic output data;	100G/200G CFP2 ACO Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/cfp2-aco/; 100G CFP Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp/; 100G CFP2 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100gcfp2/; 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-modules/100g-qsfp28/; 100G Optical Devices Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g); 100G QSFP28 Transceiver Product Page, http://www.fujitsu.com/jp/group/foc/en/products/optical-devices/#ln-100g; Flashwave CDS Data Sheet; Flashwave 7420 Data Sheet) By way of example and without any limitation, the OIF 100G standard taught a transceiver module in which the optical signal is received by Rx through a fiber input and converted to electronic output data, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 9.

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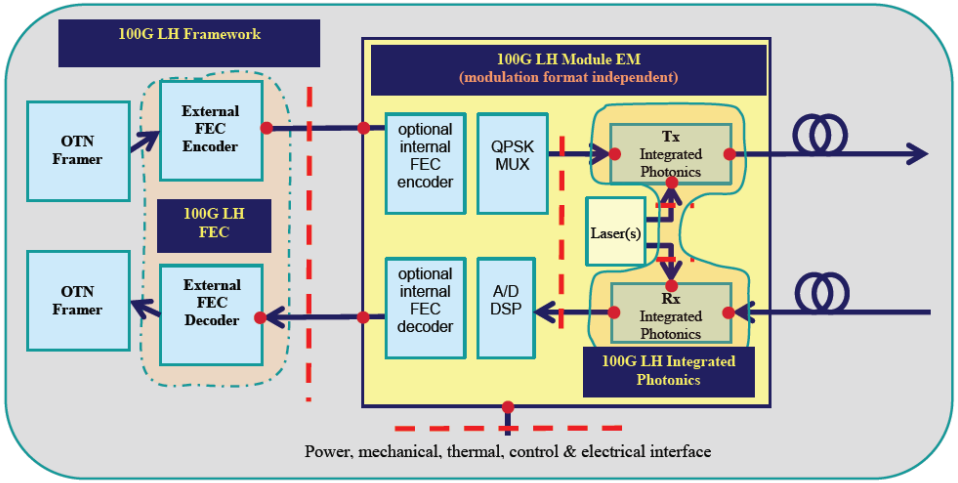
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 7. Block diagram of a transceiver module By way of example and without any limitation, the OIF 100G standard taught a receiver module which receives a phase modulated signal through an optical fiber, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 6.

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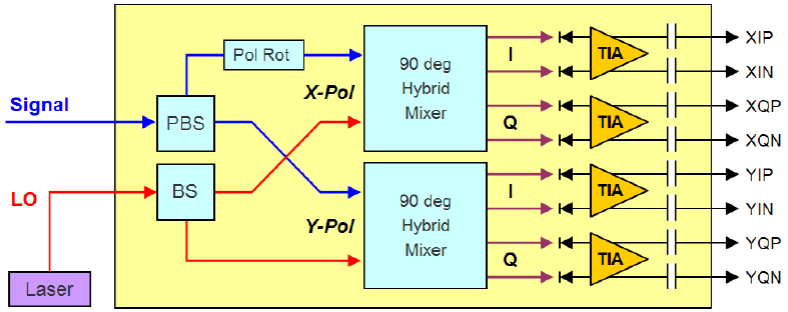
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 5. Block diagram of a DP QPSK receiver module, shown with balanced detection and outputs. By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise a method for receiving the optical signals from the optical fiber at a receiver of a further telecommunications box and converting the optical signals to electronic output data. *See, e.g.,* Exemplary Evidence of Infringement of Claim 1[d].
	[e] passing the phase-modulated optical signals to a photodetector to produce an electric signal; and	The Accused Instrumentalities pass the optical signals to a photodetector to produce an electric signal. As noted above, the OIF 100G standard taught a transceiver module in which the optical signal is received by Rx through a fiber input and converted to electronic output data, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 9. By way of example and without any limitation, the OIF 100G standard taught a receiver module with a number of optical components that form a demodulator, followed by optical detectors and transimpedance amplifiers, as shown below. See, e.g., OIF-FD-100G-DWDM-01.0 at 6.

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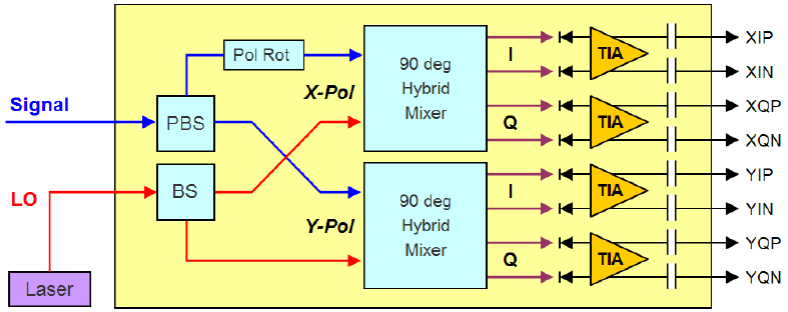
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 Figure 5. Block diagram of a DP QPSK receiver module, shown with balanced detection and outputs. By way of example and without any limitation, an OIF 100G standard taught that As indicated in Figure 2-1, the coherent receiver requires the following basic functionality: 1. Eight (8) photo-detectors, comprised of 4 sets of balanced detectors 2. Four (4) linear amplifiers with differential ADC coupled outputs 3. Two (2) ninety degree hybrid mixers with differential outputs 4. A polarization splitting element, separating the input signal into two orthogonal polarizations, with each polarization delivered to a hybrid mixer 5. A polarization maintaining power splitter or polarization splitting element, splitting the local oscillator power equally to the two hybrid mixers. 6. An optical power tap, and monitor photodiode in the signal input path before the signal polarization splitting element.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		7. A variable optical attenuator in the signal input path before the signal polarization splitting element. Additional required functionality for the integrated coherent receiver includes: • Automatic Gain Control (AGC) and/or Manual Gain Control (MGC) • User settable output voltage swing • Independent output swing adjustment for each of the four outputs • Peak indicators for each output (Figure 2-1 is presented below, showing the relationship of the functionalities in addition to the presence of ADC and DSP). OIF-DPC-MRX-01.0-IA at 10-11.

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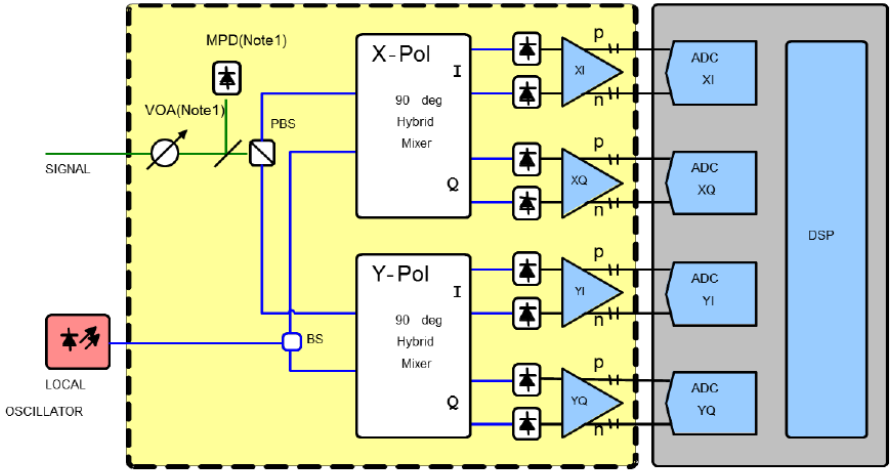
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 **Figure 2-1: Functional diagram of a dual polarization micro intradyne coherent receiver.** Notes: 1. One configuration for the order of the VOA and MPD is shown. The configuration with the MPD followed by the VOA is an equally acceptable configuration. 2. The yellow area enclosed by the dashed line indicates the functionality specified in this implementation agreement. By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise a method for passing the phase-modulated optical signals to a photodetector to produce an electric signal. *See, e.g.*, Exemplary Evidence of Infringement of Claim 1[e].
	[f] filtering the electrical signal to produce an average	The Accused Instrumentalities filter the electrical signal to produce an average optical power.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	optical power.	By way of example and without any limitation, an OIF 100G standard disclosed the use of a splitter to split the incoming optical signal to divert a portion of optical signal to the monitor photodiode as the optical signal is received by the receiver for demodulation. The monitor photodiode is used to generate an electrical signal that is filtered to determine an average optical power. See, e.g., OIF-DPC-MRX-01.0-IA at 10-11; see also the figure below.

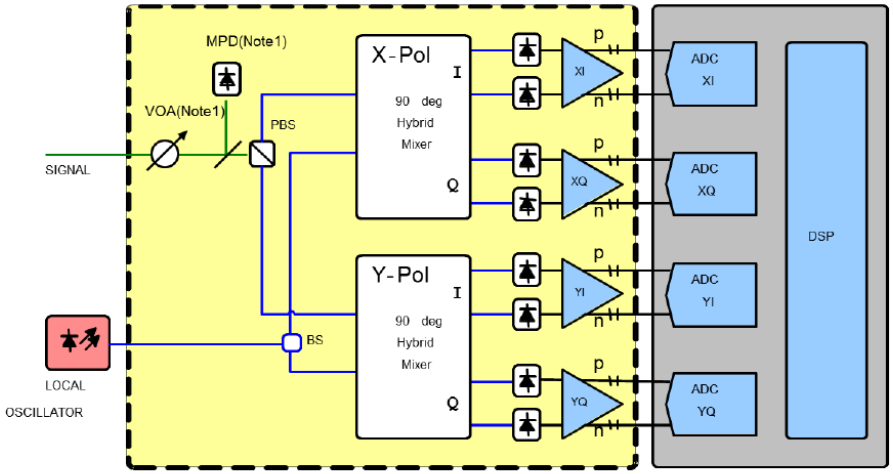

Figure 2-1: Functional diagram of a dual polarization micro intradyne coherent receiver.

Notes:

1. One configuration for the order of the VOA and MPD is shown. The configuration with the MPD followed by the VOA is an equally acceptable configuration.
2. The yellow area enclosed by the dashed line indicates the functionality specified in this implementation agreement.

By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise a method for filtering the electrical signal to produce an average

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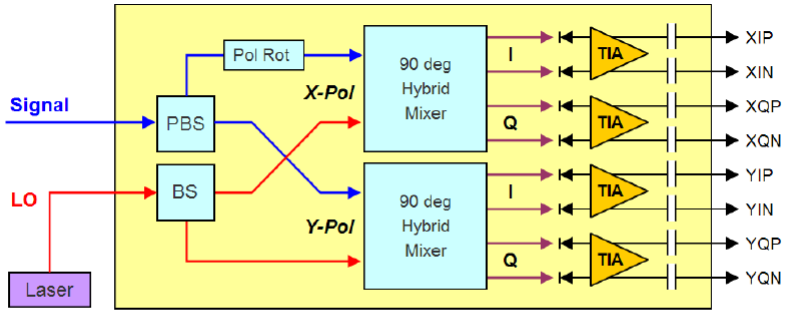
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		optical power. *See, e.g.,* Exemplary Evidence of Infringement of Claim 1[f].
10	The method as recited in claim 9 further comprising scaling the electrical signal after filtering with a logarithmic or linear amplifier.	On information and belief, the Accused Instrumentalities scale the electrical signal after filtering with a logarithmic or linear amplifier. By way of example and without any limitation, the OIF 100G standard stated that DP QPSK receiver module contains optical detectors and amplifiers, as depicted below. See, e.g., OIF-FD-100G-DWDM-01.0 at 6.  Figure 5. Block diagram of a DP QPSK receiver module, shown with balanced detection and outputs. By way of example and without any limitation, an OIF 100G standard taught that As indicated in Figure 2-1, the coherent receiver requires the following basic functionality: 1. Eight (8) photo-detectors, comprised of 4 sets of balanced detectors 2. Four (4) linear amplifiers with differential ADC coupled outputs 3. Two (2) ninety degree hybrid mixers with differential outputs

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		4. A polarization splitting element, separating the input signal into two orthogonal polarizations, with each polarization delivered to a hybrid mixer 5. A polarization maintaining power splitter or polarization splitting element, splitting the local oscillator power equally to the two hybrid mixers. 6. An optical power tap, and monitor photodiode in the signal input path before the signal polarization splitting element. 7. A variable optical attenuator in the signal input path before the signal polarization splitting element. Additional required functionality for the integrated coherent receiver includes: • Automatic Gain Control (AGC) and/or Manual Gain Control (MGC) • User settable output voltage swing • Independent output swing adjustment for each of the four outputs • Peak indicators for each output (Figure 2-1 is presented below, showing the relationship of the functionalities in addition to the presence of ADC and DSP). OIF-DPC-MRX-01.0-IA at 10-11.

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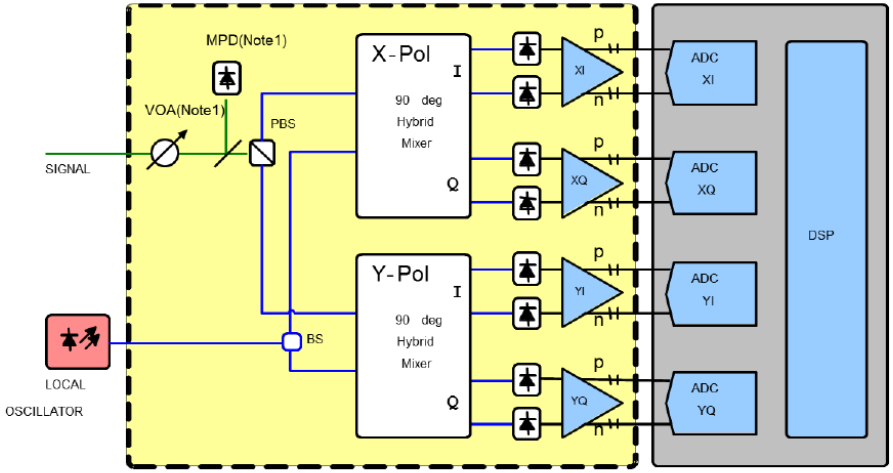
Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
		 **Figure 2-1: Functional diagram of a dual polarization micro intradyne coherent receiver.** Notes: 1. One configuration for the order of the VOA and MPD is shown. The configuration with the MPD followed by the VOA is an equally acceptable configuration. 2. The yellow area enclosed by the dashed line indicates the functionality specified in this implementation agreement. By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise the method as recited in claim 9 further comprising scaling the electrical signal after filtering with a logarithmic or linear amplifier. *See, e.g.*, Exemplary Evidence of Infringement of Claim 2.
11	The method as recited in claim 10 wherein the scaling is	On information and belief, the Accused Instrumentalities scale the electrical signal as a function of an expected optical power level.

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Asserted Claim No.	Claim Element	Exemplary Evidence of Infringement
	a function of an expected optical power level.	By way of example and without any limitation, an OIF 100G standard taught that devices should have "Alarm/Warning Threshold Registers," including an "RX Power Monitor Alarm/Warning Threshold Select." (OIF-CFP2-ACO-01.0, at 81) The the electrical signal is scaled as a function of an expected optical power level so that the alarm/warning threshold settings provide a meaningful indication of when the power is out of an acceptable range. By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise the method as recited in claim 10 wherein the scaling is a function of an expected optical power level. *See, e.g.,* Exemplary Evidence of Infringement of Claim 3.
12	The method as recited in claim 10 wherein the scaling is a function of a span length of the optical fiber.	On information and belief, the Accused Instrumentalities scale the electrical signal as a function of a span length of the optical fiber. By way of example and without any limitation, an OIF 100G standard taught that devices should have "Alarm/Warning Threshold Registers," including an "RX Power Monitor Alarm/Warning Threshold Select." (OIF-CFP2-ACO-01.0, at 81) The the electrical signal is scaled as a function of an expected optical power level, such as that correlating to a span length of the optical fiber. so that the alarm/warning threshold settings provide a meaningful indication of when the power is out of an acceptable range. By way of example and without any limitation, Fujitsu's Flashwave 9500 Series products and 1Finity products comprise the method as recited in claim 10 wherein the scaling is a function of a span length of the optical fiber. *See, e.g.,* Exemplary Evidence of Infringement of Claim 4.

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